

In the Claims:

Please amend Claims 1, 2, 6, 26, 27, 31-33, 35, and 37-39, and cancel Claims 5, 7, 28-30, 34, and 36 without prejudice, and add new Claim 44. A complete copy of the claims as amended appears below.

1 1. (Currently Amended) A solid state laser gain medium having first and second ends
2 along a laser optical axis in which ~~at least one~~ each end is profiled concave to provide a
3 level of thermal ~~lensing~~ lens compensation at a ~~predetermined~~ desired operating pump
4 ~~power, in which power such that the predetermined beam has a beam quality is centered~~
5 ~~substantially on a maximum~~ maximized at the ~~predetermined~~ the desired operating pump
6 ~~power. power, wherein the solid state laser gain medium is operable in a laser oscillator~~
7 cavity that is optically symmetrical and includes flat cavity end reflectors.

1 2. (Currently Amended) A solid state laser gain medium as defined in Claim 1, ~~in~~
2 ~~which both ends of the solid state laser gain medium are profiled. wherein the solid state~~
3 laser gain medium is operable in a laser oscillator cavity arranged to incorporate a
4 Q-switch or further gain modules.

1 3. (Previously Presented) A solid state laser gain medium as defined in Claim 1, in
2 which the solid state laser gain medium is formed of Nd:YAG.

1 4. (Previously Presented) A laser oscillator cavity including a solid state laser gain
2 medium as defined in Claim 1.

1 5. (Cancelled).

1 6. (Currently Amended) A laser oscillator cavity as defined in Claim 4, further
2 comprising:
3 a Q-switch having first and second acousto-optic cells ~~and~~ in respective first and
4 second non-parallel polarization orientations, wherein at least one of said first and second
5 acousto-optic cells has a reflective end forming a cavity end reflector.

1 7. (Cancelled).

1 8. (Previously Presented) A laser oscillator cavity as defined in Claim 4, further
2 comprising:
3 a frequency converter; and
4 a frequency selective reflector between the solid state laser gain medium and the
5 frequency converter.

1 9. (Previously Presented) A laser including a solid state laser gain medium as defined
2 in Claim 1.

1 10. (Previously Presented) A laser as defined in Claim 9, further comprising:
2 a side-pumping diode element.

11-22. (Cancelled).

1 23. (Previously Presented) A laser ablation device comprising a laser as defined in
2 Claim 9.

24-25. (Cancelled).

1 26. (Currently Amended) A laser amplifier ~~having:~~ including a solid state laser gain
2 medium as defined in Claim 1, said laser amplifier further comprising:
3 a laser cavity; and
4 an amplifying module external to the laser cavity, said amplifying module sharing
5 a common axis of emission with said laser cavity and comprising an amplifier gain
6 medium having first and second ends along said axis of emission;
7 whereby at least one of said first or second ends of said amplifying module is profiled to
8 produce a lensing effect so as to directly couple light from said laser cavity into said
9 amplifying module.

1 27. (Currently Amended) A laser amplifier as defined in Claim 26, wherein one or
2 both of said first ~~an~~ or second ends of said amplifying module are profiled to form an
3 amplifier lens having a predetermined focal length in order to maximize the beam quality
4 of the laser cavity at a desired pump power, and wherein the amplifier lens is one of a
5 refractive lens, a diffractive lens, or a GRIN lens.

1 28. (Cancelled).

1 29. (Cancelled).

1 30. (Cancelled).

1 31. (Currently Amended) A laser amplifier as defined in Claim ~~30~~, 27, wherein said
2 ~~lens of at least one end of said solid state laser gain medium and said~~ is profiled to form a
3 first lens of amplifier gain medium have having a focal length that is substantially equal
4 to the focal lengths. length of said amplifier lens.

1 32. (Currently Amended) A laser amplifier as defined in Claim ~~30~~, 26, whereby said
2 laser gain medium lens and said amplifier gain medium lens are concavely profiled.

1 33. (Currently Amended) A laser amplifier as defined in Claim 26, wherein said laser
2 gain medium and said amplifying gain medium are pumped simultaneously, and wherein
3 said laser gain medium pump and said amplifying pump have equal power.

1 34. (Cancelled).

1 35. (Currently Amended) A laser amplifier as defined in Claim 26, in which an input
2 surface to the ~~amplifier~~ amplifying module is tilted.

1 36. (Cancelled).

1 37. (Currently Amended) A laser amplifier having:
2 a laser cavity; and
3 an amplifying module external to the laser cavity, said amplifying module sharing
4 a common axis of emission with said laser cavity and comprising a laser gain medium
5 having first and second ends along said axis of emission;
6 whereby at least one of said first or second ends is profiled so as to directly couple light
7 from said laser cavity into said amplifying module;
8 wherein said laser gain medium and said amplifying medium are pumped simultaneously;
9 ~~A wherein in said module as defined in Claim 33, in which,~~ for an amplifier medium
10 comprising a rod of diameter D_R , length L_R , refractive index n_L , refractive index of air

11 n_{air} , and thermal focal length f_{th} arranged to receive an input beam from a laser having
12 waist distance d_0 from the input rod end, the rod is profiled with a radius of curvature R
13 given approximately by $R = \frac{d_0(4f_{th} - L_R)(n_L - n_{air})}{n_L(4f_{th} - L_R - 2d_0)}$.

1 38. (Currently Amended) A method of making a solid state laser amplifier module
2 gain medium having first and second ends and further comprising flat cavity end
3 reflectors along a laser optical axis, said solid state laser gain medium being for use in an
4 optically symmetrical laser oscillator cavity arranged to produce a laser beam, said
5 method comprising:
6 profiling concavely at least one each end thereof of the solid state laser gain
7 medium to provide a level of lensing thermal lens compensation at a predetermined
8 operating pump power, arranged such that, in use, the amplifier can be directly coupled to
9 a laser of predetermined parameters, power in order to maximize the beam quality of the
10 beam at said desired operating pump power.

1 39. (Currently Amended) A method of designing a laser amplifier comprising
2 ~~identifying~~ having a profile as defined in Claim ~~34, 37~~.

40-42. (Cancelled).

1 43. (Previously Presented) A laser assembly comprising a gain medium as defined in
2 Claim 1 and an amplifier as defined in Claim 26 coupled therewith.

1 44. (New) A module as defined in Claim 33, in which, for an amplifier medium
2 comprising a rod of diameter D_R , length L_R , refractive index n_L , refractive index of air
3 n_{air} , and thermal focal length f_{th} arranged to receive an input beam from a laser gain
4 medium having waist distance d_0 from the input rod end, the rod is profiled with a radius
5 of curvature R given approximately by $R = \frac{d_0(4f_{th} - L_R)(n_L - n_{air})}{n_L(4f_{th} - L_R - 2d_0)}$.